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ABSTRACT

The Occupational Shortages Reporting System (OSRS) is a computerized system developed to produce quick and accurate reports on occupational shortages for given time periods and given occupations in Texas. The system's salient features are: easy and fast retrievability of information; expandability of the data base (from the present 1,254 occupations coded according to the United States Department of Labor's Dictionary of Occupational Titles); and ability to project future shortages from the analysis of past data. The guide describes the Input Subsystem, explaining the three different types of input data (occupational description cards, city name cards, and occupational shortage cards) and their method of coding and preparation, and illustrating their exact layout forms. It next discusses the Computer Subsystem, centering on the generation of a data base which contains all available information on occupational shortages and including the system flowchart and methodology of programing. Finally the guidelines describes the Output Subsystem, explaining and presenting a sample of the output report on occupational shortages. (Author/JR)

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MAR 1975

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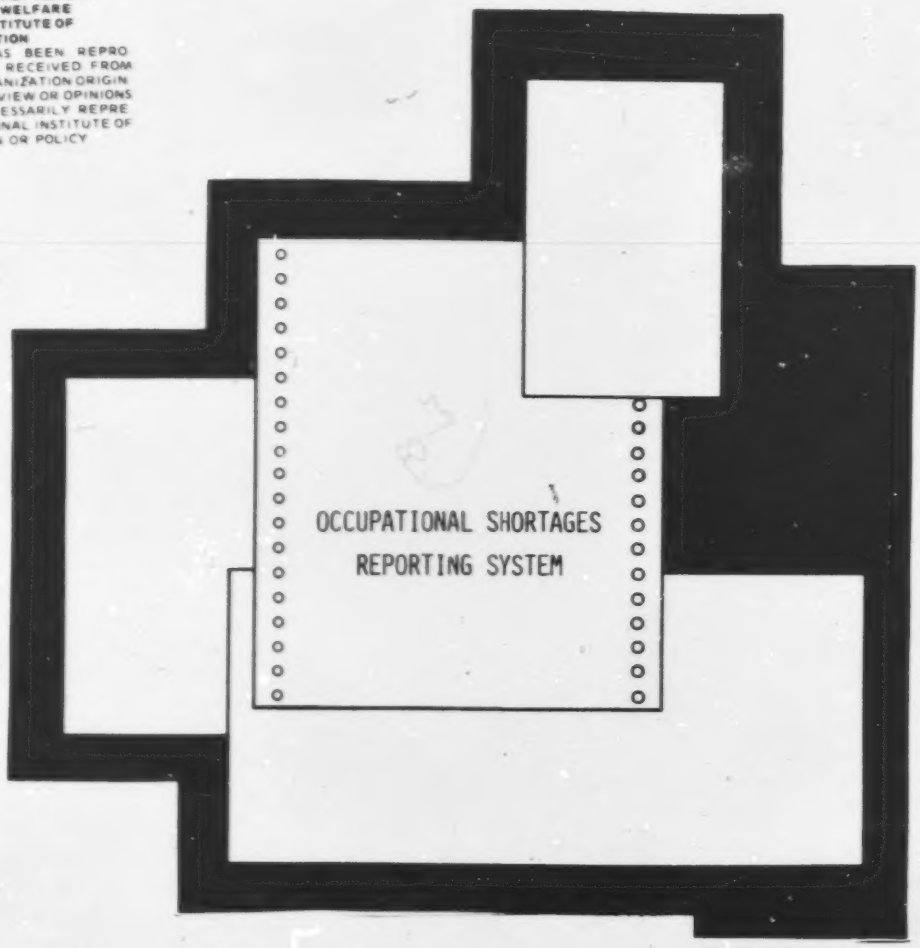

JAMES CONNALLY CAMPUS

TEXAS STATE TECHNICAL INSTITUTE

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TEXAS STATE TECHNICAL INSTITUTE

WACO, TEXAS

OCCUPATIONAL SHORTAGES STUDY REPORTING SYSTEM

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OCTOBER 1974

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This report contains a detailed description of the Occupational Shortages Reporting System, to be abbreviated as OSRS henceforth. The motivation of creating the OSRS and its salient features are briefly described in the Introduction. The OSRS consists of three parts; Input Subsystem, Computer Subsystem, and Output Subsystem. In the Input Subsystem Section, three different types of input data needed to produce occupational shortages report are described and their exact layout forms are illustrated. The method of coding and preparing data are also discussed. In the Computer Subsystem Section, the discussion centers on the generation of a data base which contains all available information on occupational shortages. System Flowchart and the methodology of programming are also presented. In the output Subsystem Section, the output report on occupational shortage study is described and its format is illustrated by the sample output report.

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The Texas Employment Commission, hereafter abbreviated to TEC, has been publishing monthly tables of occupational shortages in thirty three major cities in the state of Texas. These tables have been compiled manually for the period of January 1970 to the present and contain enormous amount of data.

It has been found that it is very difficult and time consuming to use these tables to look into particular occupational shortages. At the original suggestion of Mr. Jerry Harris, a computerized system has been devised to produce quick and accurate reports on occupational shortages for given time periods and given occupations. This OSRS is intended to aid educators and those who are engaged in manpower research and decision making in human resource management.

The data base is generated from available TEC data for the period January 1970 to the present. In addition classified want-ads data covering thirty key Texas cities is included beginning September 1974. The data base generated from these two major sources is expected to produce useful and reliable reports on the occupational shortages study.

The salient features of this system can be stated as:

(1) The information on shortages report for a particular occupation at a particular given time can be retrieved easily from this data base.

(2) The time to retrieve a shortages report is approximately 14 sec (with IBM 360/22) for each occupation.

(3) OSRS report data is related to the U.S. Department of Labor data through the Dictionary of Occupational Titles (D.O.T.) Code. The D.O.T. Code is a 6-digit numeric code for the job title and is used by the U.S. Department of Labor and other government agencies.

(4) The data base can be expanded to include additional occupations. (At this reporting time, October 1974, there are 1,254 different occupations stored in the data base).

(5) The system provides a simplified procedure to obtain reliable and accurate reports on occupational shortages at present time or past.

(6) The future shortages in a given occupation may be predicted from the analysis of past data.

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This computerized Occupational Shortages Reporting System is a combined effort of Mr. Jerry Harris and the writer. In particular, acknowledgement is due to Mr. Harris regarding the designs of the input and output report forms.

I. INPUT SUBSYSTEM

A. Source of Data

1. TEC data

Input data of the OSRS are obtained from the tables of occupational shortages published by Texas Employment Commission on monthly basis. This table contains the occupational shortages listed in twenty three reporting units which consist of thirty three major cities in Texas. The occupations are grouped in four different categories:

1. Professional, Technical, and Managerial
2. Clerical and Sales
3. Services
4. Processing, Machine Trade, Bench Work, Structural Work, and Miscellaneous

Sample TEC data is shown in the next page.

2. Classified Want-Ads Data

The second source of OSRS input data are classified want-ads of Sunday papers from thirty three major cities in Texas. These cities are the same ones which supplied TEC data.

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OCCUPATIONAL SHORTAGES

July 1974

Occupation	Abilene	Amarillo	Austin	Beaumont-Port Arthur-Orange	Brownsville-Harlingen-San Benito	Corpus Christi	Dallas	El Paso	Fort Worth	Galveston-Texas City	Houston	Laredo	Longview-Marshall	Lubbock	McAllen-Pharr-Edinburg	Midland-Odessa	San Angelo	San Antonio	Sherman-Denison	Texarkana	Tyler	Waco	Wichita Falls
PROFESSIONAL, TECHNICAL, AND MANAGERIAL																							
Accountants		x		x	x						x				x	x						x	
Administrative Assistant		x																					
Architect, Marine				x																			
Buyer						x																	
Cataloger								x															
Chemist				x																			
Comptroller						x																	
Consultant						x																	
Detailer													x										
Dialysis Technician						x																	
Dietician						x									x	x							
Draftsman (all types)		x	x	x		x	x		x		x		x			x	x	x	x				x
Electroencephalograph Tech.											x												
Electronic Technician					x		x							x				x					
Engineer																							
Aeronautical																x							
Chemical				x			x				x												
Civil		x		x			x		x		x		x										
Electrical				x									x			x							
Electronic											x						x						
Industrial													x										
Mechanical				x			x				x		x								x		
Plant				x																			
Sanitation													x										
Structural							x						x										
Engineering Assistant						x																	
Estimator				x		x																	
Executive Housekeeper																x							
Floral Designer						x																	

B. Types of Data and Their Formats

PROCEDURE

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CARD 1: Occupational Description Card

NO. REQUIRED: One card for each occupation

FUNCTION: Describes occupation and assigns

(1) Group Code

(2) Internal Code (subdivided into Major and Minor) and

(3) D.O.T. Code (See below for the definitions of these codes.)

Column	Format	Variable	Description
1- 1	X(1)	CARD-CODE	Constant "W"
2- 2	9	ACTION-CODE	1-Add; 2-change
3- 3	X(1)	INTERNAL CODE-MAJOR	Range is A-Z
4- 5	X(2)	INTERNAL CODE-MINOR	Range is 01-99
6-50	X(45)	OCCUP-DESC	Occupation Description
51-51	9	GROUP-CODE	1 thru 4
52-52	X(1)		Not used
53-59	X(7)	D.O.T.-CODE	Dictionary of Occupational Titles Code
60-80	X(21)		Not used

(1) Group-Code: One digit numeric code assigned to four different occupational categories:

1 Professional, Technical, Managerial

2 Clerical and Sales

3 Services

4 Processing, Machine Trade, Bench Work, Structural Work, and Miscellaneous

CARD 1: Occupational Description Card (Cont'd)

(2) Internal Code, (Major/Minor): A unique number assigned to each occupation.

The following table shows the assignement of the internal code to the occupations in four different groups.

INTERNAL CODE MAJOR	MINOR	GROUP-CODE
A	00-99	1
B	00-99	1
C	00-99	1
D	00-99	1
E	00-99	1
F	00-99	2
G	00-99	2
H	00-99	2
I	00-99	2
J	00-99	2
K	00-99	3
L	00-99	3
M	00-99	3
N	00-99	3
O	00-99	3
P	00-99	4
Q	00-99	4
R	00-99	4
S	00-99	4
T	00-99	4
U	00-99	4
V	00-99	4
W	00-99	4
X	00-99	4
Y	00-99	4
Z	00-99	4

PROCEDURE

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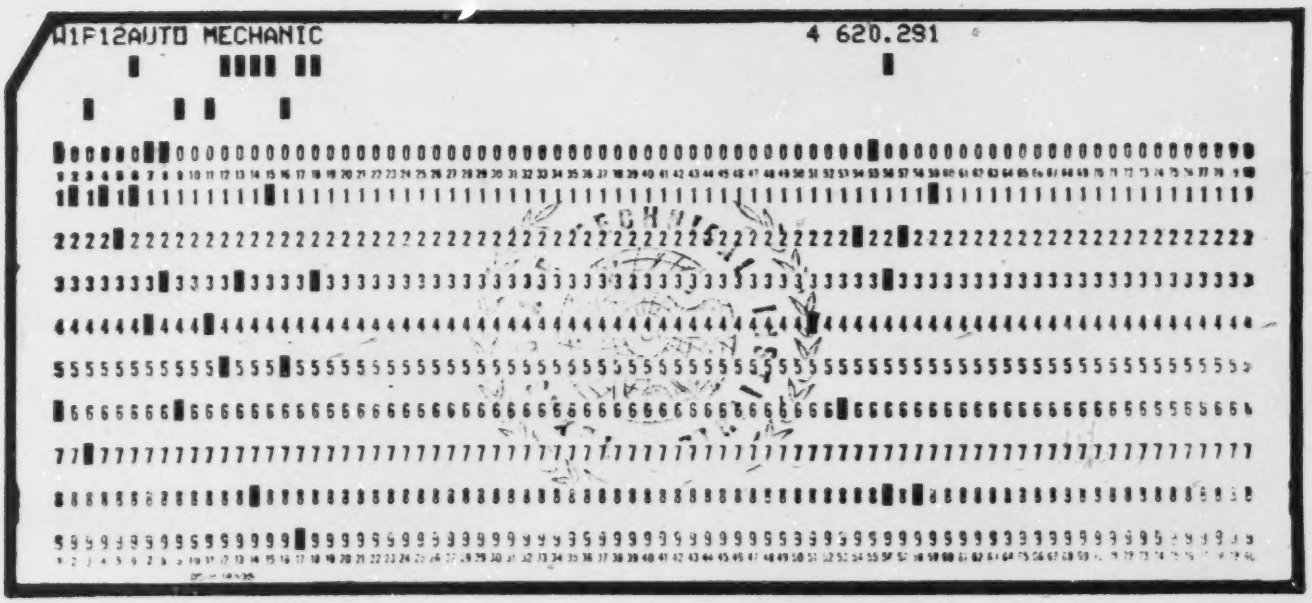
CARD 1: <u>Occupational Description Card</u> (Cont'd)

(3) D.O.T. Code: (Dictionary of Occupational Titles Code)

Six digits numeric code is assigned to each occupation and adopted by the Dictionary of Occupational Titles.(1),(2)

D.O.T. Code is not unique; i.e., many related occupations share the same D.O.T. Code.

<u>SAMPLE INPUT OF OCCUPATIONAL DESCRIPTION CARD</u>:



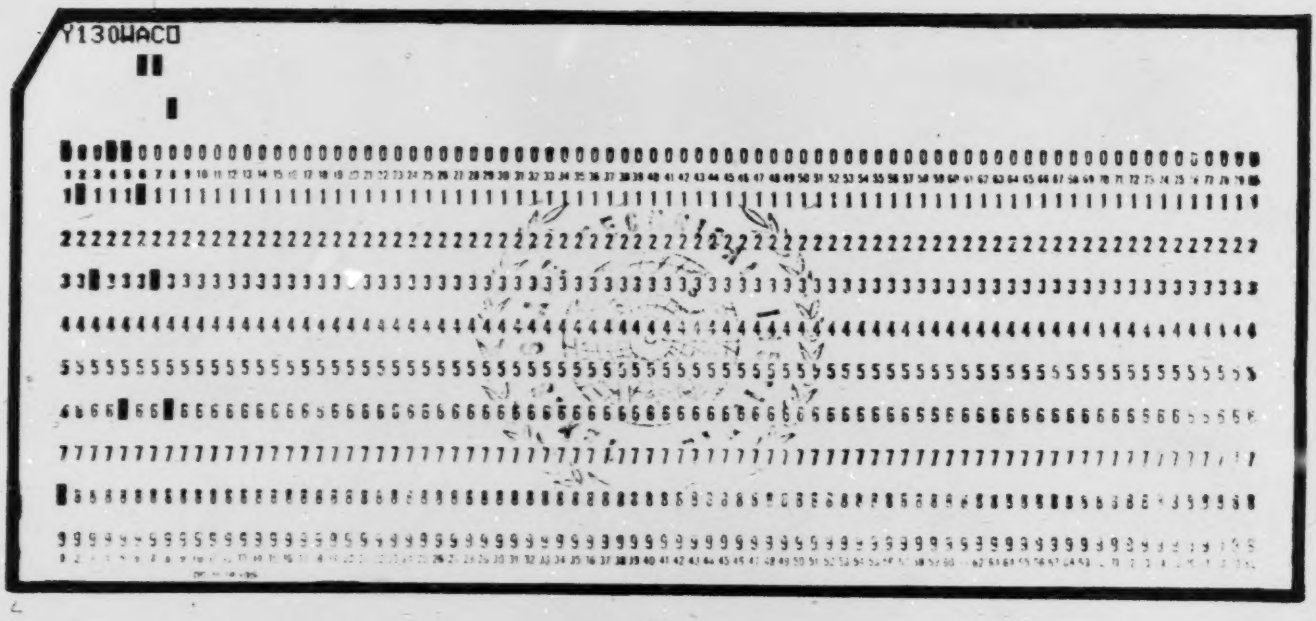
CARD 2: City Name Card

NO. REQUIRED: One card for each city

FUNCTION: Assigns city number to each city (there are thirty three cities used in this study).

Column	Format	Variable	Description
1- 1	X(1)	CARD-CODE	Constant "Y"
2- 2	9	ACTION-CODE	1-Add; 2-Change
3- 4	99	CITY-NUMBER	Range is 9 to 31
5-18	X(14)	CITY-NAME	Name of City
19-80	X(62)		Not used

SAMPLE INPUT OF CITY NAME CARD:



CARD 3: Occupational Shortages Data Card

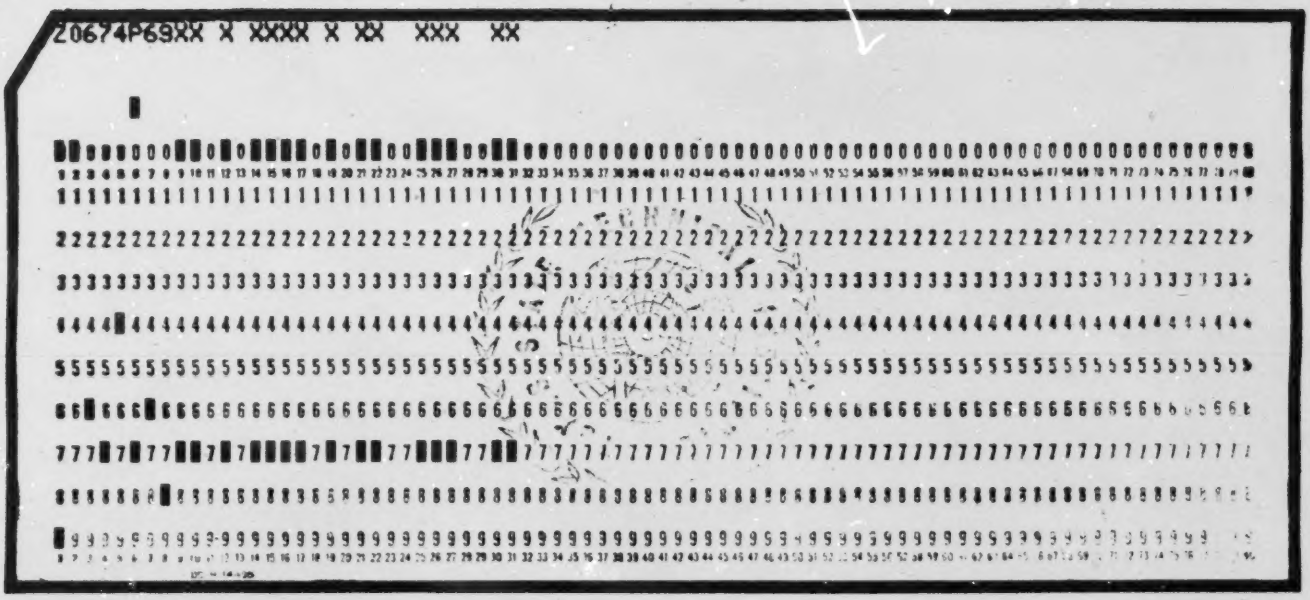
NO. REQUIRED: One card for each occupation

FUNCTION: Describes the shortages; there are shown date, occupation and city in which shortages occurred.

Column	Format	Variable	Description
1- 1	X(1)	CARD-CODE	Constant "Z" if TEC data Constant "Q" if classified want-ads data
2- 3	X(2)	DATE-MONTH	Month
4- 5	X(2)	DATE-YEAR	Year
6- 6	X(1)	INTERNAL CODE-MAJOR	Range is A-Z
7- 8	X(2)	INTERNAL CODE-MINOR	Range is 01-99
9-31	X(23)	SELECTIONS	Constant "X" if shortage exists(*)
32-80	X(49)		Not used

Note: (*) Card column number 9 thru 31 correspond to the city number. If shortages occur in a particular occupation in a particular city with city number k, "X" is entered in column k.

SAMPLE OF OCCUPATIONAL SHORTAGES DATA CARD:



C. Sample Input Coding Forms

OCCUPATIONAL AND EDUCATIONAL RESEARCH DEPARTMENT

OCCUPATIONAL SHORTAGES PROJECT

TEC DATA INPUT FORM

C	MO		YR	
Z				
1	2	3	4	5

MAJ	MIN		ABILENE	AMARILLO	AUSTIN	BEAUMONT-PORT ARTHUR-ORANGE	BROWNSVILLE-HARLINGEN-SAN BENITO	CORPUS CHRISTI	DALLAS	EL PASO	FORT WORTH	GALVESTON-TEXAS CITY	HOUSTON	LAREDO	LONGVIEW-MARSHALL	LUBBOCK	McALLEN-PHARR-EDINBURG	MIDLAND-ODESSA	SAN ANGELO	SAN ANTONIO	SHERMAN-DENISON	TEXARKANA	TYLER	WACO	WICHITA FALLS
6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31

C MO YR
/0/ / /
1 23 45

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OCCUPATIONAL SHORTAGES PROJECT
CLASSIFIED WANT-ADS
(INPUT FORM)

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678		09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
P03	ABLE SEAMAN	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
B77	ABSTRACTOR	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
A01	ACADEMIC DEAN	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
A02	ACCOUNTANTS	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
F45	ACCOUNTING CLERK	2I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
S02	ACIDIZER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
S78	ACOUSTICAL CARPENTER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
G94	ADDING MACHINE OPERATOR	2I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
A03	ADMINISTRATIVE ASSISTANT	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
B78	ADVERTISING LAY-OUT MAN	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
S79	AGRICULTURE AIDE	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
A04	AGRONOMIST	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
P04	AIR CONDITIONER INSTALLER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
P05	AIR CONDITIONING MECHANIC	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
U83	AIR-COMPRESSOR MECHANIC	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
R13	AIRCRAFT ACCESSORIES MECHANIC	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
T40	AIRCRAFT AND ENGINE MECHANIC	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
S26	AIRPLANE PILOT HELPER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
C94	AIRPLANE PILOT, COMMERCIAL	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
L16	ALL-AROUND PRESSER	3I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
P07	ALTERATION TAILOR	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
K72	AMBULANCE DRIVER	3I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
K65	ANIMAL CONTROL	3I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
V72	ANIMAL SKINNER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
V76	ANTENNA INSTALLER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
C37	APPAISER	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
B40	ARCHITECT	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
C27	ARCHITECT-MARINE	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
C18	ARCHITECTURAL-DELINEATOR	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
V99	ARMATURE WINDER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
A05	ART LAYOUT MAN	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
T77	ASPHALT TAR & GRAVEL ROOFER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
U17	ASPHALT WORKER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
S03	ASPHALT-PAVING FOREMAN	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
P08	ASPHALT-PAVING MACHINE OPERATOR	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
R53	ASSEMBLER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
S81	ASSEMBLER-PRODUCTION	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
C39	ASSEMBLER-SMALL PRODUCTS	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
B41	ATHLETIC COACH	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
G67	AUCTIONER	2I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
T78	AUDIO-VIDEO REPAIRMEN	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
B94	AUDIOVISUAL SPECIALIST	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
G55	AUDIT CLERK	2I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
C19	AUDITOR	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
B13	AUDITOR-INTERNAL	1I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
V85	AUTO ASSEMBLY INSTALLER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
V73	AUTO BODY REPAIRMAN	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
P11	AUTO BODY REPAIRMAN & HELPER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
U53	AUTO GENERATOR REPAIRMAN	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
T88	AUTO MACHINE SHOP GRINDER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
T41	AUTO MACHINIST	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
P12	AUTO MECHANIC	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
T42	AUTO MECHANIC & HELPER	4I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I

OCCUPATIONAL AND EDUCATIONAL RESEARCH DEPARTMENT

OCCUPATIONAL SHORTAGES PROJECT

OCCUPATION DESCRIPTION INPUT FORM

CARD	ACTION	MAJOR	MINOR	OCCUPATION DESCRIPTION	GROUP	NOT USED	JOB CODE NO.
1	2	3	4 5	6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	51	52	53 54 55 56 57 58 59
1	2	3	4 5	6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50	51	52	53 54 55 56 57 58 59

OCCUPATIONAL AND EDUCATIONAL RESEARCH DEPARTMENT

OCCUPATIONAL SHORTAGES PROJECT

CITY NAME INPUT FORM

CARD	ACTION	CITY NO.		CITY NAME														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	

D. Guide for Coding and Preparing Input Data

(1) To Code Occupational Shortages Data

The following procedure applies to both TEC data and the classified want-ads data. The only difference between the two sets of data is that TEC data has constant 'Z' entered in column 1 in the data field and classified want-ads data has constant 'Q' in column 1. Both alphabetic and numeric lists of occupations are needed to code both data.

Step 1. Month and year of shortages are entered in the spaces provided and marked as Col. 2 thru 5 in the input coding form.

Step 2. Occupation Description of shortage is searched in the alphabetic list. If occupation is found, its internal code, major and minor are entered in Col. 6 thru 8. If occupation is not found, a new internal code is created; this is done by looking up the numeric list of occupations, and assigning next available number in major and minor sequence. The new major and minor code are entered in Col. 6 thru 8.

Step 3. Next, the shortage is indicated by 'X' and entered in proper city columns. If shortage exists in city k, 'X' is entered in column k.

(2) To Code Occupation Description Data

Step 1. Constant 'W' is entered in col. 1.

Step 2. Action code, 1 for add, 2 for delete is entered in col. 2.

Step 3. Major and minor of internal occupation code is entered in col. 3 thru 5.

Step 4. Occupation description is entered in col. 6 thru 50.

Step 5. Group code is entered in col. 51.

Step 6. D.O.T.(1),(2) code is searched in the Dictionary of Occupational Titles, Vol. I and Vol. II and entered in col. 53 thru 59.

(3) To Code City Name Data

Step 1. Constant 'Y' is entered in col. 1.

Step 2. Action code, 1 for add, 2 for delete is entered in col. 2.

Step 3. City number is entered in col. 3 thru 4.

Step 4. City name is entered in col. 5 thru 18.

Sample sheets from alphabetic list and numeric list are shown next.

**** ALPHA LIST OF OCCUPATIONS **** RUN DATE 09/25/74
PAGE 1

GROUP I. PROFESSIONAL,TECHNICAL,MANAGERIAL

W1B77ABSTRACTOR	1	119.288
W1A01ACADEMIC DEAN	1	090.118
W1A02ACCOUNTANTS	1	160.188
W1A03ADMINISTRATIVE ASSISTANT	1	169.168
W1B78ADVERTISING LAY-OUT MAN	1	141.081
W1A04AGRONOMIST	1	040.081
W1C94AIRPLANE PILOT, COMMERCIAL	1	196.283
W1C37APPRAISER	1	191.288
W1B40ARCHITECT	1	001.081
W1C27ARCHITECT-MARINE	1	001.081
W1C18ARCHITECTURAL-DELINEATOR	1	970.281
W1A05ART LAYOUT MAN	1	141.081
W1B41ATHLETIC COACH	1	099.288
W1B94AUDIOVISUAL SPECIALIST	1	099.168
W1C19AUDITOR	1	160.188
W1B13AUDITOR-INTERNAL	1	160.188
W1C78BANK,CASHIER	1	186.168
W1C68BIOCHEMIST	1	041.081
W1C55BIOLOGIST	1	041.081
W1B70BIOSTATISTICIAN	1	020.188
W1C96BROKERAGE-MANAGER	1	
W1A96BUILDING INSPECTOR	1	168.168
W1A06BUSINESS INSTRUCTOR	1	
W1A65BUYER	1	162.158
W1C95CAPTIAN-FISHING VESSEL	1	197.133
W1B42CASEWORK SUPERVISOR	1	195.168
W1A07CASEWORKER	1	195.108
W1C34CATALOGER	1	100.388
W1B26CHAINMAN	1	018.687
W1A08CHEMIST	1	022.081
W1B52CHEMIST PHARMACEUTICAL	1	041.081
W1B27CHEMIST-INORGANIC	1	022.081
W1B28CHEMIST-ORGANIC	1	022.081
W1D32CHEMIST-WATER PURIFICATION	1	022.281
W1B14CITY PLANNING AID	1	199.388
W1B15CLINICAL CHEMIST	1	041.081
W1A66CLINICAL PSYCHOLOGIST	1	045.108
W1B16CLOTHES DESIGNER	1	142.081
W1B29COMMERCAL DESIGNER	1	142.081
W1D36COMMERICAL ARTIST	1	141.081
W1D06COMMUNITY ORGANIZATION WORKER	1	195.168
W1C79COMPTROLLER	1	186.118
W1C21COMPUTER PROGRAMMER	1	020.168
W1A09CONSTRUCTION INSPECTOR	1	182.287
W1C80CONSULTANT	1	077.128
W1C10CONTROL LABORATORY TECHNICIAN	1	029.381
W1A37CONTROLLER	1	186.118
W1A97CONTROLLER ASSISTANT	1	
W1A10COPY READER	1	132.288
W1C82COPY WRITER	1	132.088
W1A79CORE ANALYST	1	010.281
W1D04COST ESTIMATOR	1	229.448
W1A11COUNSELOR	1	045.108
W1D12COUNSELOR II (BILIN,MASTERS DEGREE)	1	045.108
W1D14COUNSELOR-CAMP	1	159.228
W1B43CREW LEADER	1	180.168
W1C22DANCE INSTRUCTOR	1	151.028

**** NUMERIC LIST OF OCCUPATIONS **** RUN DATE 09/24/74
PAGE 1

GROUP I. PROFESSIONAL,TECHNICAL,MANAGERIAL

W1A01ACADEMIC DEAN	1 090.118
W1A02ACCOUNTANTS	1 160.138
W1A03ADMINISTRATIVE ASSISTANT	1 169.168
W1A04AGRONOMIST	1 040.081
W1A05ART LAYOUT MAN	1 141.081
W1A06BUSINESS INSTRUCTOR	1
W1A07CASEWORKER	1 195.108
W1A08CHEMIST	1 022.081
W1A09CONSTRUCTION INSPECTOR	1 182.287
W1A10COPY READER	1 132.288
W1A11COUNSELOR	1 045.108
W1A12DETAILER	1 017.281
W1A13DIRECTOR	1 159.168
W1A14DRAFTSMAN-ALL TYPES	1 017.281
W1A15ELECTROENCEPHALOGRAPH TECHNICIAN	1 078.368
W1A16ELECTRONIC ENGINEER	1 003.081
W1A17ELECTRONIC TECHNICIAN	1 024.288
W1A19ENGINEER-AERONAUTICAL	1 002.081
W1A20ENGINEER-CHEMICAL	1 008.081
W1A21ENGINEER-CIVIL	1 005.081
W1A22ENGINEER-DESIGN	1
W1A23ENGINEER-ELECTRICAL	1 003.081
W1A24ENGINEER-INDUSTRIAL	1 012.188
W1A25ENGINEER-MECHANICAL	1 007.081
W1A26ENGINEER-PLANT	1 007.187
W1A27ENGINEER-SENIOR	1
W1A28ENGINEER-STRUCTURAL	1 005.081
W1A29ENGINEER-TOOL	1 007.081
W1A30ENGINEERING ASSISTANT	1 007.181
W1A31ESTIMATOR	1 183.288
W1A32FACULTY MEMBER-COLLEGE OR UNIVERSITY	1 090.228
W1A33FLORAL DESIGNER	1 142.081
W1A34GEOPHYSICIST	1 024.081
W1A35INDUSTRIAL ENGINEERING TECHNICIAN	1 012.288
W1A37INSTRUCTOR-VOCATIONAL TRAINING	1 097.228
W1A38INSTRUMENTATION TECHNICIAN	1 003.281
W1A39INSTRUMENT MAN	1 710.281
W1A41MANAGER-CAFETERIA OR LUNCHROOM	1 187.168
W1A42MANAGER-PRODUCTION	1 180.168
W1A44MANAGER-RADIO STATION	1
W1A45MANAGER-TRAINEE	1 189.168
W1A47MEDICAL PERSONNEL-ANESTHESIOLOGIST	1 070.108
W1A48MEDICAL PERSONNEL-INHALATION THERAPIST	1 079.368
W1A49MEDICAL PERSONNEL-MEDICAL TECHNOLOGIST	1 078.381
W1A50MEDICAL PERSONNEL-NURSE,GENERAL DUTY	1 075.378
W1A51MEDICAL PERSONNEL-NURSE,LVN	1
W1A52OCCUPATIONAL THERAPIST	1 079.128
W1A53PHYSICAL THERAPIST	1 079.378
W1A54PRODUCTION PLANNER	1 012.188
W1A55PRODUCTION SUPERINTENDENT	1 183.118
W1A56PROGRAMMER	1 020.188
W1A57RADIO OFFICER	1 193.282
W1A58RADIOLOGIC TECHNOLOGIST	1 078.368
W1A59REPORTER	1 132.268
W1A60SOCIOLOGIST	1 054.088
W1A61SURVEYOR	1 018.188
W1A62SYSTEMS ANALYST	1 012.168

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II. COMPUTER SUBSYSTEM

A. Generation of Data Base

The occupational shortages data base consists of two master files; Occupational Shortages Data Master File (OSDM) and Occupational Description Master File (ODMF).

The OSDM is generated by loading occupational shortages (OS) data after going through a validity check. Subsequent OS data is combined with previous OSDM to produce a new OSDM. Data from TEC is identified by 'Z' in column 1 and data from classified want-ads by 'Q' in column 1 in the data field. The OSDM contains information on the occupational shortages in thirty three major cities in Texas, and its date and internal occupation code. The OS data are stored in OSDM in the internal occupation code order.

The OSMF is generated from the occupation description data. Duplicate data and invalid characters in the data fields are checked before data are loaded. Alphabetic and numeric lists of occupations are produced at this loading time. The ODMF contains informations on the occupation description, internal occupation code, D.O.T.(1),(2) code and group code. The data in ODMF are arranged in the internal occupation code order.

Two master files, OSDM and ODMF, described above are merged together to produce an occupational shortages study report.

Sample of Occupational Shortages Data Master File

```
Z1071P92 X         X   XX X
Z1071P94           X      X
Z1071P99    X   X
Z1071Q02 X   XX   XX     X   X
Z1071Q04 X         X  X  X   X
Z1071Q05   X
Z1071Q12 X
Z1071Q15                     X
Z1071Q17           X
Z1071Q18            X
Z1071Q23           X
Z1071Q24           X
Z1071Q26 X X  X
Z1071Q28     XXXXX      X
Z1071Q31        X
Z1071Q33   X       X
Z1071Q34              X  X   X X
Z1071Q35           X
```

TEC Data

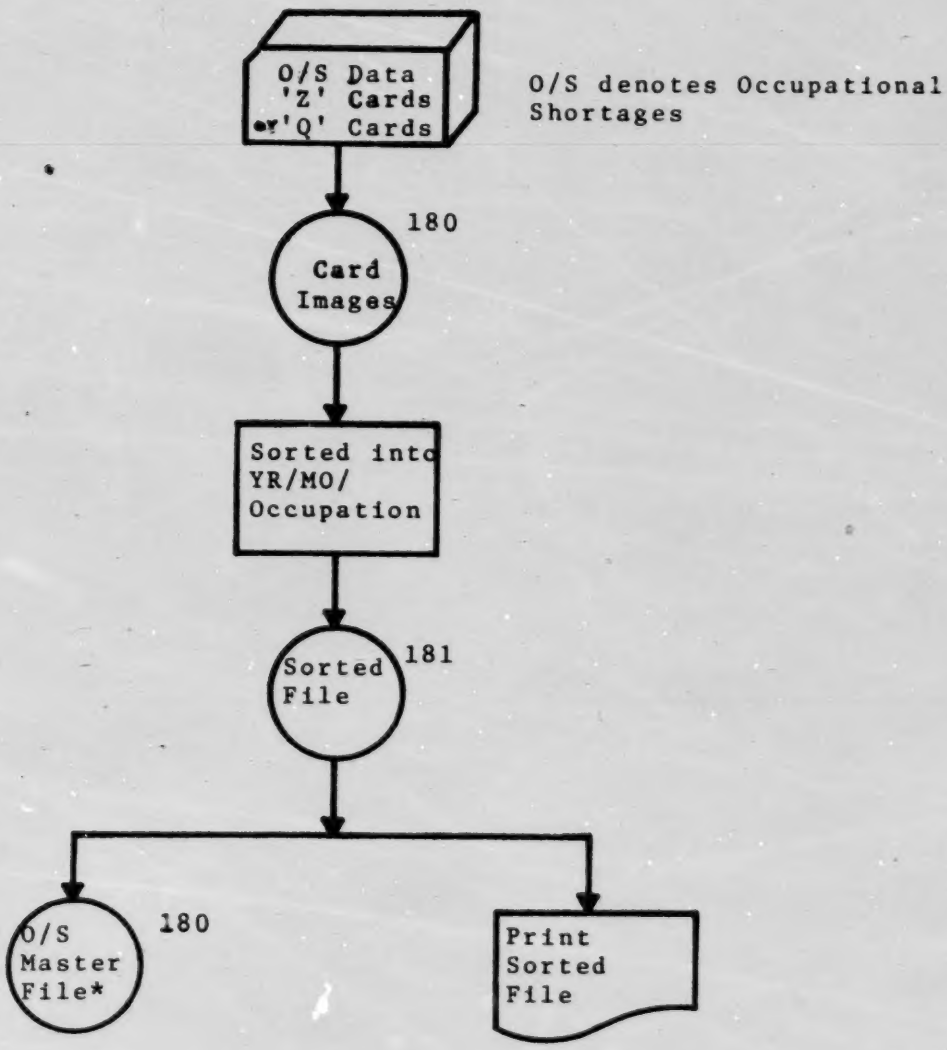
```
Q0972A15           X       X
Q0972A17 X           X
Q0972A20                     X
Q0972A21   X
Q0972A24    X
Q0972A25 X         X    X
Q0972A28  X                  X
Q0972A33                X
Q0972A37           X
Q0972A45   X
Q0972A47        X
Q0972A48     X            X
Q0972A49            XX
Q0972A50 X               X
Q0972A51                   X
Q0972A53   XX
Q0972A58           X           X
Q0972A69      X        X     X
```

Classified Want-Ads Data

B. System Flowchart

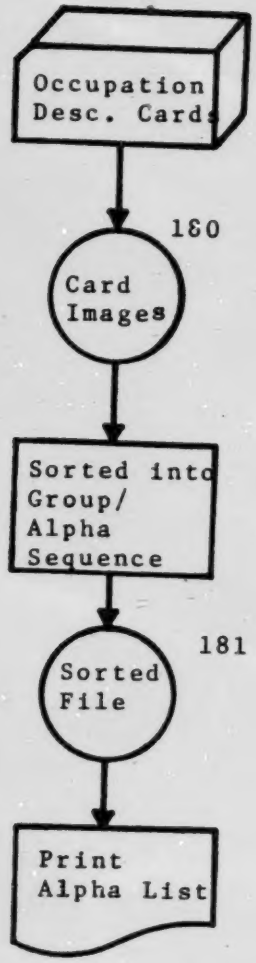
PROCEDURE

	Subject	Department	
	1. CREATE OCCUPATIONAL SHORTAGES DATA MASTER FILE	OER	
		Author: Theresa Park	
		Date: Oct. 1974	Page: 28

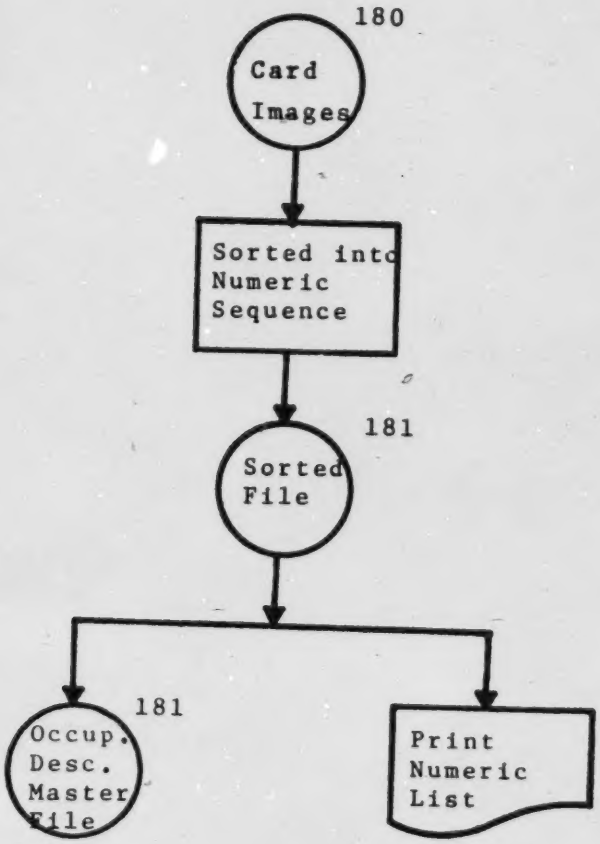


* Record Length = 80
Card Images of 'Z' or 'Q' card

	Subject	Department	
	2. CREATE OCCUPATION DESCRIPTION MASTER FILE	OER	
		Author: Thersa Park	
		Date: Oct. 1974	Page: 29

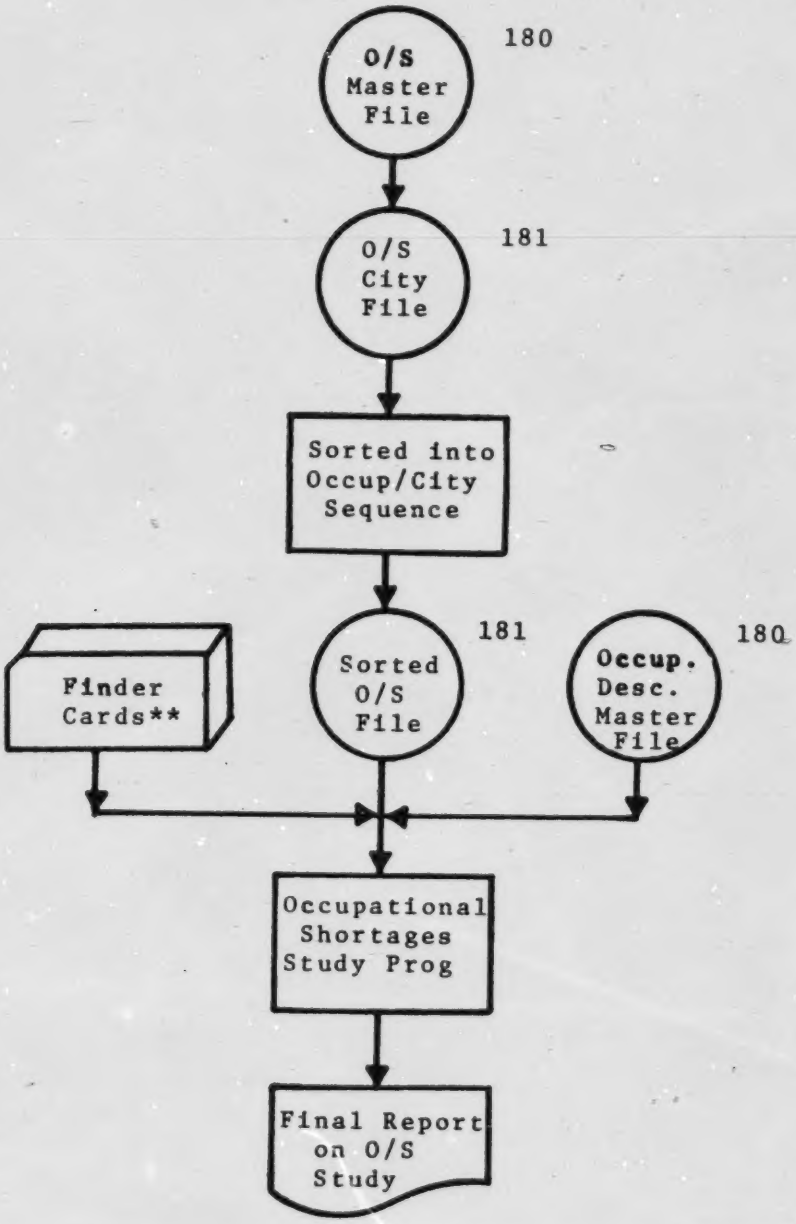


	Subject	Department	
	2. CREATE OCCUPATION DESCRIPTION MASTER FILE	OER	
		Author: Theresa Park	
		Date: Oct. 1974	Page: 30



PROCEDURE

	Subject	Department	
	3. RETRIEVAL OF OCCUPATIONAL SHORTAGES REPORT USING FINDER CARD	OER	
		Author: Theresa Park	
		Date: Oct. 1974	Page: 31



** Occupation Code of interest is punched in Col. 1 to 3 of finder card.

C. Program Description

Program is written in COBOL-D language and employs structural programming and top-down development technique.

D. System Limitations

The limitations of OSRS can be stated as:

(1) The occupational shortages reports from classified want-ads data are not available prior to Sept. 1974.

(2) Due to the limited print spaces, the summary of occupational shortages in each occupation cannot be viewed more than seven years at one time.

E. Auxiliary Storage Units Required

Two tape units of IBM 2400 and two direct access storage devices of IBM 2311 are required.

III. OUTPUT SUBSYSTEM

A. Description of Output

The output of OSRS shows the source of data in the form of (TEC DATA) or (CLASSIFIED WANT-ADS) at the top of the page under the heading. Occupational Description and its internal code and D.O.T. (1),(2) code are printed.

The summary of this occupational shortages is printed in matrix form. The rows of this matrix are twenty three reporting units consisting of thirty three major cities in Texas which supplied OSRS input data. Each reporting unit consists of one to three cities. The columns of this matrix are months from Jan. 1970 to Dec. 1976.

The occupational shortages are shown in X and appear in corresponding row and column of the given city and date.

At the end, "Total All Cities" from 1970 to 1976 and "Total All Cities All Years" are printed out. They are defined as:

$$(\text{Total All Cities})_{YR} = \left(\sum_{i=1}^{23} X_i\right)_{YR} \qquad (1)$$

where X_i is a one occurrence of shortage and has a value of one or more than one shortages.

$$(\text{Total All Cities All Years}) = \sum_{YR=1}^{7} (\text{Total All Cities})_{YR} \qquad (2)$$

Since the shortages reported as 'X' do not represent a unique numerical value, the figures obtained by (1) and (2) are the measure of shortages in occurences.

B. Sample Output of OSRS

OCCUPATIONAL AND EDUCATIONAL RESEARCH DEPARTMENT
OCCUPATIONAL SHORTAGES STUDY
(TEC DATA)

RUN DATE 09/09/74
PAGE 1297

OCCUPATION AIR CONDITIONING MECHANIC P-05 620.281

CITY	1970 JFMAMJJASOND	1971 JFMAMJJASOND	1972 JFMAMJJASOND	1973 JFMAMJJASOND	1974 JFMAMJJASOND	1975 JFMAMJJASOND	1976 JFMAMJJASOND
ABILENE	X		X	XXXXXXXXX			
AMARILLO	X		XX	XX			
AUSTIN					XX		
BEAUMONT-	X		XX X	XXX XXXX	X		
PORT ARTHUR-	X		XX X	XXX XXXX	X		
ORANGE	X		XX X	XXX XXXX	X		
BROWNSVILLE-	X		X	X X	XX XXX		
HARLINGEN-	X		X	X X	XX XXX		
SAN BENITO	X		X	X X	XX XXX		
CORPUS CHRISTI	XX XX	XXX X	X X X	X X			
DALLAS	XX X X	XXXXXXX	XXXX	X			
EL PASO	X			X X	XX X		
FORT WORTH	X						
GALVESTON-	X	X	X	XX			
TEXAS CITY	X	X	X	XX			
HOUSTON	XX XXX X XX	XXXXXXXXX	X				
LAREDO		XX		XX X X			
LONGVIEW-	X X			XX X XX			
MARSHALL	X X			XX X XX			

OCCUPATIONAL AND EDUCATIONAL RESEARCH DEPARTMENT
OCCUPATIONAL SHORTAGES STUDY
(TEC DATA)

RUN DATE 09/09/74
PAGE 1298

OCCUPATION AIR CONDITIONING MECHANIC P-05 620.281

CITY	1970 JFMAMJJASOND	1971 JFMAMJJASOND	1972 JFMAMJJASOND	1973 JFMAMJJASOND	1974 JFMAMJJASOND	1975 JFMAMJJASOND	1976 JFMAMJJASOND
LUBBOCK	X						
MCALLEN-PHARR-EDINBURG	X X X						
MIDLAND-ODESSA							
SAN ANGELO	X			XXX XXX X X	XXX XX		
SAN ANTONIO	X XX X			XX			
SHERMAN-DENISON	X X			X X	X X		
TEXARKANA		X	X		X		
TYLER	X	XXXX X		X	XX XX		
WACO	X XXX	X X	X	X	X X		
WICHITA FALLS	X						

	1970	1971	1972	1973	1974	1975	1976
TOTAL ALL CITIES	39	31	18	49	24	0	0

TOTAL ALL CITIES ALL YEARS 161

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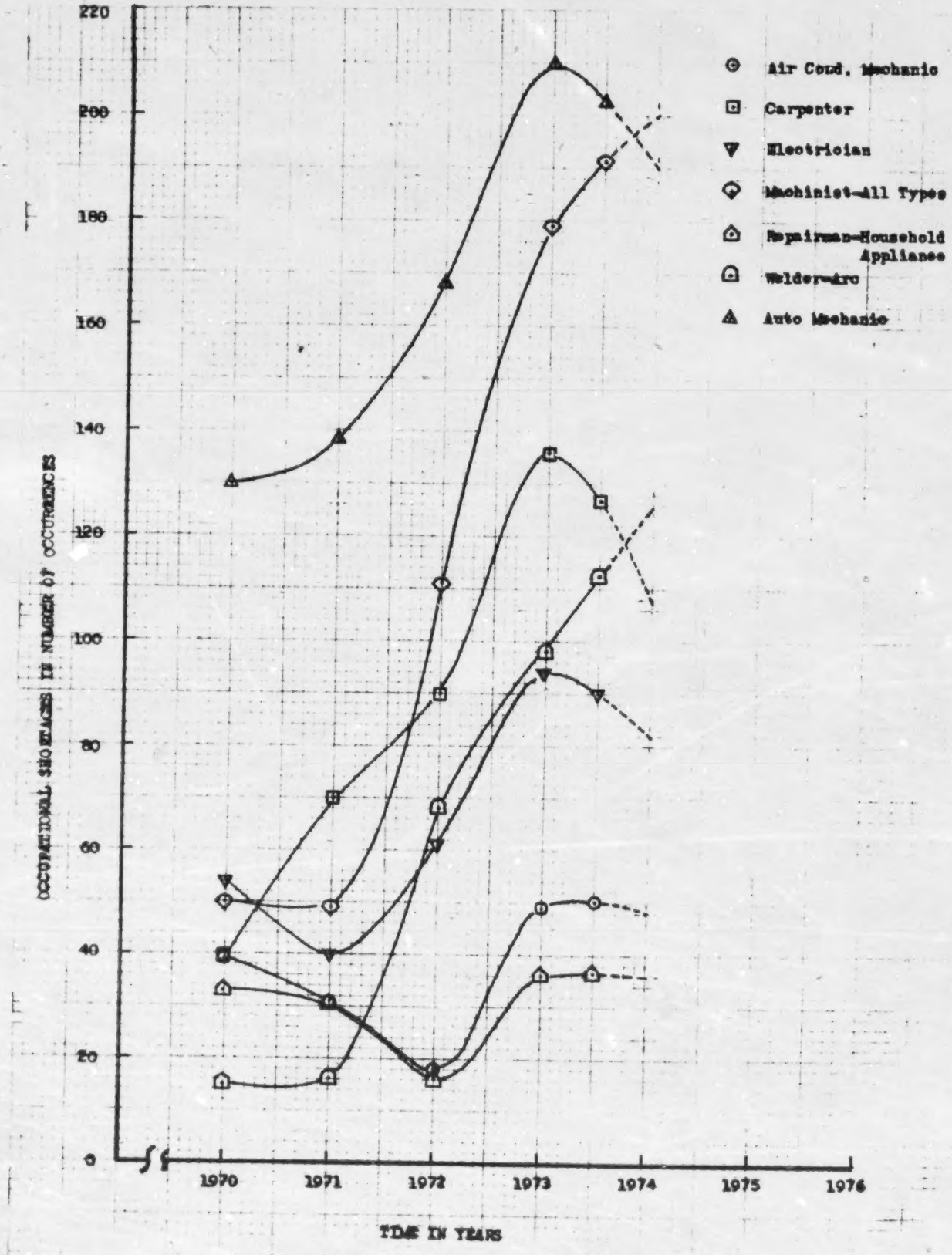
C. Graphical Representation of Shortages in Some Occupations

YEARLY SHORTAGES IN SAMPLE OCCUPATIONS FOR THE PERIOD OF JANUARY 1970 TO JUNE 1974



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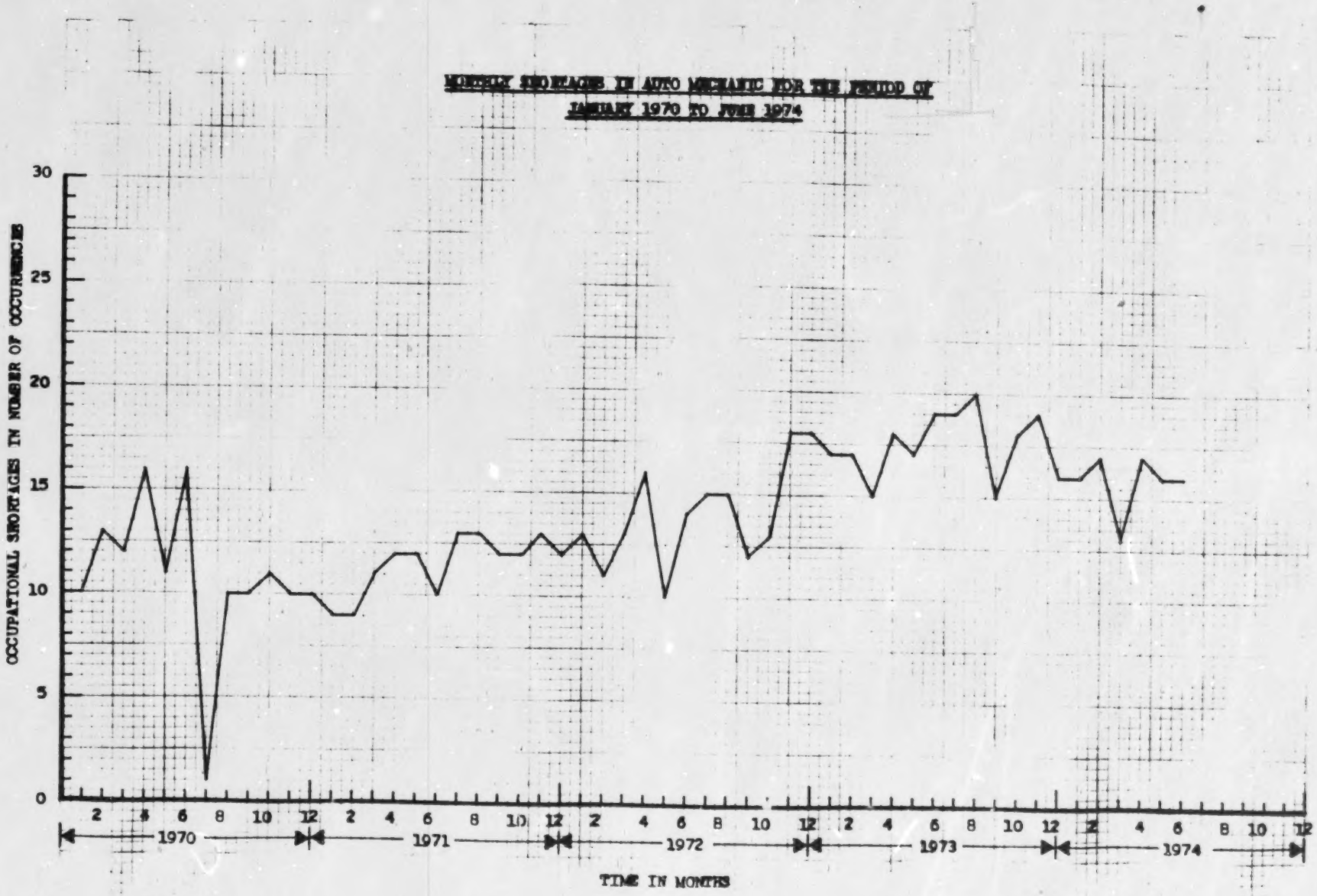
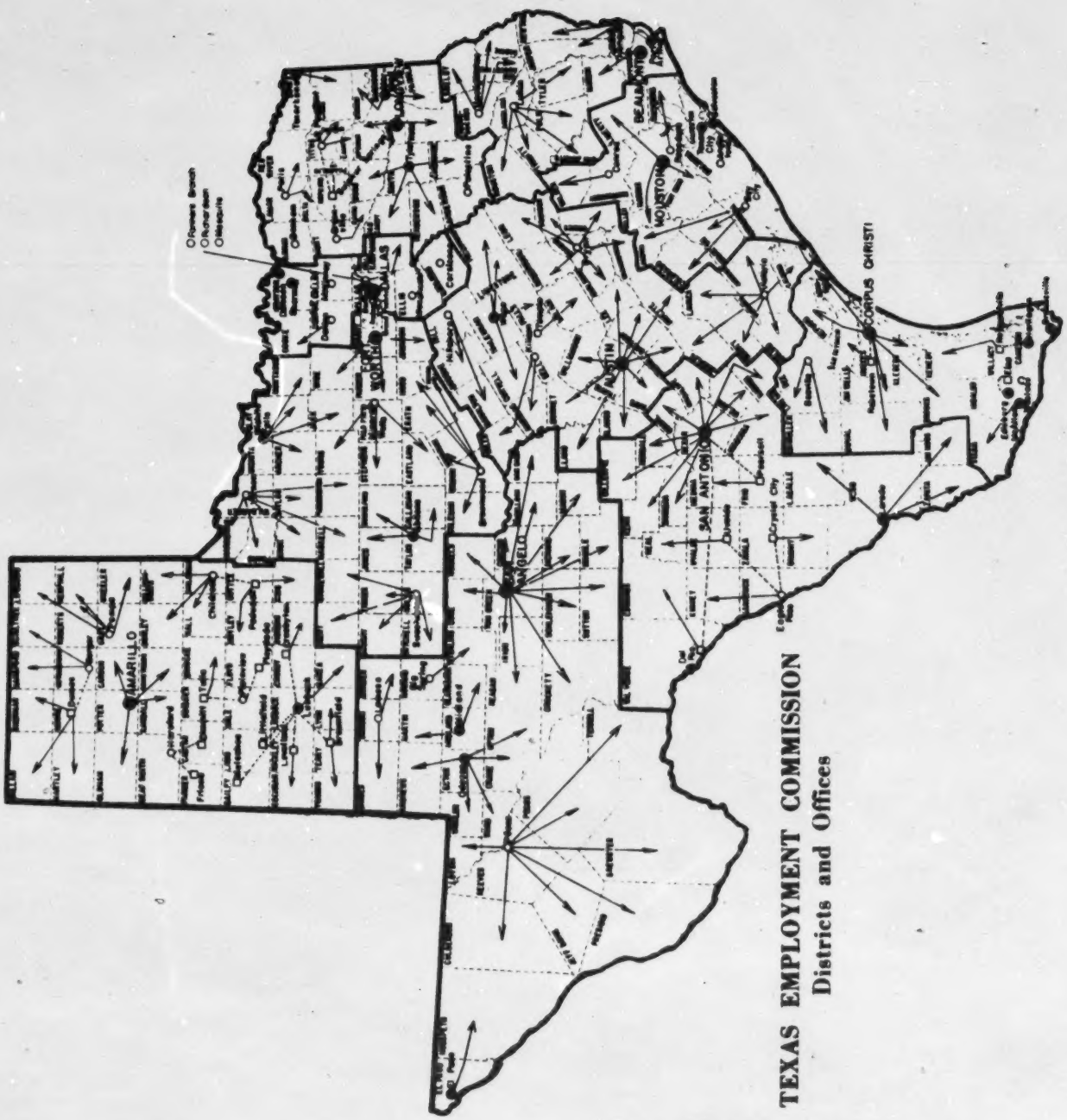


Map of the State of Texas showing the locations of cities which supplied TEC data.



TEXAS EMPLOYMENT COMMISSION
Districts and Offices

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V. REFERENCES

1. W. Willard Wirtz, Secretary U.S. Department of Labor, Dictionary of Occupational Titles, (1965), Vol. I, Definitions of Titles, Third Edition.

2. W. Willard Wirtz, Secretary U.S. Department of Labor, Dictionary of Occupational Titles, (1965), Vol. II, Occupational Classification, Third Edition.

3. Texas Employment Commission, Waco, Texas Area, Area Manpower Review, (1974).